

< CLAIMS >

1. In a power supply circuit for plasma generation by which said plasma is generated due to discharge occurred between discharge generating electrodes composed of first and second electrodes by applying an alternating high voltage to said discharge generating electrodes, said power supply circuit for plasma generation comprising:

said discharge generating electrodes composed of two or more first electrodes and one or more second electrodes; and

an alternating high voltage generating circuit to generate said alternating high voltage applied between said first and second electrodes of said discharge generating electrodes;

wherein a condenser (a capacitor) and a coil (an inductor) are connected in series between said first electrode and one output end of said alternating high voltage generating circuit.

2. The power supply circuit for plasma generation according to claim 1, wherein said alternating high voltage generating circuit includes a high frequency transformer, two or more output circuits branched in parallel from one end side of a secondary side coil of said high frequency transformer are connected to said first electrodes, each of said output circuits is formed by a series connection of said condenser and said coil, and said second electrode is connected to another end side of said secondary side coil.

3. The power supply circuit for plasma generation according to claim 1, wherein said alternating high voltage generating circuit includes a high frequency transformer, a plurality of secondary side coils are arranged at a secondary side of said high frequency transformer, one or more output circuits branched in parallel from one end side of each secondary side coil are connected to said first electrodes, each of said output circuits is formed by a series connection of said condenser and said coil, and said second electrode is connected to another end side of said secondary side coil.

4. In a plasma generating apparatus by which said plasma is generated due to discharge occurred between discharge generating electrodes composed of first and second electrodes by applying an alternating high voltage to said discharge generating electrodes, said plasma generating apparatus comprising:

said discharge generating electrodes composed of two or more first electrodes and one or more second electrodes; and

an alternating high voltage generating circuit to generate said alternating high voltage applied between said first and second electrodes of said discharge generating electrodes;

wherein a condenser (a capacitor) and a coil (an inductor) are connected in series between said first electrode and one output end of said alternating high voltage generating circuit.

5. The plasma generating apparatus according to claim 4, wherein said alternating high voltage generating circuit includes a high frequency transformer, two or more output circuits branched in parallel from one end side of a secondary side coil of said high frequency transformer are connected to said first electrodes, each of said output circuits is formed by a series connection of said condenser and said coil, and said second electrode is connected to another end side of said secondary side coil.
6. The plasma generating apparatus according to claim 4, wherein said alternating high voltage generating circuit includes a high frequency transformer, a plurality of secondary side coils are arranged at a secondary side of said high frequency transformer, one or more output circuits branched in parallel from one end side of each secondary side coil are connected to said first electrodes, each of said output circuits is formed by a series connection of said condenser and said coil, and said second electrode is connected to another end side of said secondary side coil.
7. The plasma generating apparatus according to claim 4, 5 or 6, wherein either one electrode of said first electrode or said second electrode has a geometry surrounding the other electrode, and a tip end portion of said one electrode is formed into a nozzle shape for emitting said plasma generated between said electrodes.
8. The plasma generating apparatus according to claim 4, 5 or 6, wherein said first electrode and said second electrode are facing, so that said plasma generated between said electrodes is emitted from an open end side of said electrodes.
9. The plasma generating apparatus according to any of claims 4 to 8, wherein said plasma generating apparatus further includes a fluid supplying means to supply a fluid into a generation area of said plasma generated between said electrodes.
10. The plasma generating apparatus according to any of claims 4 to 9, wherein each of said electrode pairs is arranged in a predetermined direction.
11. A plasma processing apparatus including the plasma generating apparatus according to any of claims 4 to 10, wherein an object to be processed is irradiated with said plasma generated between said electrodes.
12. A plasma processing apparatus including said plasma generating apparatus according to any of claims 4 to 10, wherein said plasma processing apparatus is a device irradiating an object to be processed with said plasma generated between said electrodes, and each of said electrodes is arranged so that emitting directions of said plasma generated between said electrodes are facing each other.

13. A plasma processing apparatus including said plasma generating apparatus according to any of claims 4 to 10, wherein said plasma processing apparatus is a device irradiating an object to be processed with said plasma generated between said electrodes, and each of said electrodes is arranged so that emitting positions of said plasma generated between said electrodes are formed in a spiral.
14. A plasma processing apparatus including said plasma generating apparatus according to any of claims 4 to 10, wherein said plasma processing apparatus is a device irradiating an object to be processed with said plasma generated between said electrodes, and an aggregate of said electrodes is formed in a bundle by assembling emitting portions of said plasma generated between said electrodes.
15. A plasma processing apparatus including the plasma generating apparatus according to any of claims 4 to 10, wherein said plasma processing apparatus is a device irradiating an object to be processed with said plasma generated between said electrodes, and said plasma processing apparatus further includes an adjusting means for adjusting an irradiating distance to said object to be processed irradiated with said plasma emitted from between said electrodes.
16. A plasma processing apparatus including the plasma generating apparatus according to any of claims 4 to 10, wherein said plasma processing apparatus is a device irradiating an object to be processed with said plasma generated between said electrodes, and said plasma processing apparatus further includes an adjusting means for adjusting a direction irradiating said object to be processed with said plasma emitted from each space between said electrodes.
17. The plasma processing apparatus according to any of claims 11 to 14, wherein said plasma processing apparatus further includes a passageway of object to be processed distributing said object to be processed in vicinity of each of said electrodes.
18. The plasma processing apparatus according to claim 14, wherein said plasma processing apparatus further includes a passageway of object to be processed distributing said object to be processed to the center of said aggregate of said electrodes.
19. A plasma processed object produced by use of the plasma processing apparatus according to any of claims 11 to 18, wherein said plasma processed object is produced by plasma processing of said object to be processed.